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Managing Contaminated Sites on Provincial Lands

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The Honourable Claude Richmond
Speaker of the Legislative Assembly
Province of British Columbia
Parliament Buildings
Victoria, British Columbia
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Dear Sir:

I have the honour to transmit herewith to the Legislative Assembly of British Columbia my 2002/03 Report 5: Managing Contaminated Sites on Provincial Lands.

Wayne Strelioff, CA
Auditor General

Victoria, British Columbia
December 2002

copy: Mr. E. George MacMinn, Q.C.
Clerk of the Legislative Assembly

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Auditor General's Comments

Wayne Strelioff, CA
Auditor General

British Columbia is a province rich in its natural resources. For the last 150 years, much of its industrial wealth has been earned through the use and development of these resources. Today that process continues, with forestry, mining and oil and natural gas production forming a large part of our economy. Many of these activities take place on public Crown land, which makes up more than 92 percent of all lands in British Columbia.

Provincial and federal regulations now ensure that environmental impacts from natural resource extraction and use can be minimized and, where there are unacceptable impacts, that the responsible party pays for remediation and restoration. This was not always so.

A history of economic activity on public land at a time when there were no environmental regulations in place, or when regulatory control was inadequate, has left a legacy of contaminated sites scattered across British Columbia's public lands. Sites have become contaminated either through government's own operations, such as at forestry offices or highways yards, or by actions of licensees, permittees and tenure holders who carried out their operations on public land. If those responsible for contaminating a site on public land can no longer be found or are financially destitute, then the government must assume the obligation to manage that site.

Because of what went on in the past, the provincial government is today faced with the responsibility of managing a large portfolio of contaminated sites. It is this aspect of government's role I address in this report. The current government has stated it wants to exhibit exemplary environmental stewardship, and it has made one of its objectives the removal of toxins and wastes from provincial land. Managing its contaminated sites well will be an important way for government to demonstrate it is meeting its own expectations.

The number of known or potential contaminated sites in British Columbia totals more than 3,000, and this is based on an incomplete inventory. Not all of these sites necessarily pose significant environmental, health or other public safety risks, but whatever risks exist must be understood and managed.

[illegible] [illegible] [illegible] [

Overall Conclusion

The Province does not have an adequate program in place for managing its contaminated sites and is not adequately accounting for its performance. Significant improvements are required in three main areas.

First, the foundation needed for a sound program is lacking. Ministries and agencies are not being guided by clear direction from government, and roles and responsibilities are not clearly defined. While some progress is being made, it varies from organization to organization. Some are well underway in incorporating a contaminated sites policy into their portfolios; others are only at the early stages of doing this.

Second, there are significant gaps in the information ministries and agencies need to develop management plans and to make resource allocation decisions. As a result, few management plans are in place and no government-wide plan exists.

And third, without a clear, coordinated program for guiding contaminated site management activities, ministries and agencies are unable to account in a meaningful way on their progress in dealing with the risks and liabilities posed by contaminated sites.

Key Findings

Clearer leadership, direction and coordination is needed to establish a sound program

The governance framework for the management of contaminated sites has significant gaps. Although government aspires to a high level of environmental stewardship, it has not taken on the leadership role necessary to ensure a coherent, consistent approach is taken. No one agency has the overall authority and responsibility for providing leadership and setting direction. Furthermore, despite ongoing efforts to develop them, no government-wide policies yet exist. Given the number of ministries and agencies involved in managing contaminated sites, I believe the weak governance framework and lack of a formal coordinating function are serious problems.

Two agencies are showing initiative by developing the organizational units, capacity and information needed

to manage their contaminated sites programs in an effective manner. I applaud these efforts, but still maintain that central leadership is required before a well-integrated provincial program can be achieved.

The absence of any clear central leadership and direction is particularly troublesome. It raises the possibility that the resources now devoted to dealing with these sites are not focused on the right priorities and that scarce government resources are not being used in the most efficient and effective manner. If government is to meet its objectives of being an exemplary steward and of remediating contaminated land, then it must take a leadership role and make clear its expectations. A provincial perspective is needed on this issue. There is a need for greater assurance the government is focusing its scarce resources on matters of the greatest priority.

The information critical for managing contaminated sites is incomplete

Having the right information is critical to making the right decisions. We found the information needed to manage contaminated sites in British Columbia is incomplete. Few ministries and agencies have completed their inventories of contaminated sites. In addition, assessment of sites to determine the degree of contamination and level of risk (to the environment and to public health) has been carried out on only a portion of the existing inventory.

I am also concerned that, with databases scattered among ministries, there is no easy manner in which information on contaminated sites can be consolidated, updated and analyzed to provide a province-wide perspective. I believe the systems and knowledge are available for the government to do better in managing this information.

As a result of these shortcomings, few management plans have been developed, and therefore the ministries and agencies responsible are unable to set out adequately their long-term requirements and proposals for dealing with contaminated sites. For government overall, this lack of inventories and management plans has meant no comprehensive provincial plan has been developed, and program requirements in terms of staff capacity and other resources remain unclear.

Accountability information must be improved

Accountability information is insufficient at both the government-wide and ministry/agency levels. At the government-wide level, for example, some financial information on the liabilities related to contaminated sites is reported in a note to the government's Summary Financial Statements. However, this information does not give readers a full or clear understanding of the government's recorded liability—a total of $144 million in 2001/02.

As for operational performance, information is presented on the progress of remediation efforts in relation to all contaminated sites in the province in other government reports. However, no information is provided about how the Province is progressing in managing its portfolio of contaminated sites.

Our findings were similar at the ministry/agency level. Although some financial information is provided by a few ministries and agencies, that information is not comprehensive. And only a few organizations are providing any operational information.

I believe this lack of information has made it difficult for legislators and the public to understand either the extent of the problem or how effectively government is managing the contaminated sites for which it is responsible.

Summary of Recommendations

The recommendations we formulated during this audit are broad and addressed to the provincial government.

We had several reasons for taking this approach. First, we found too much variation in the stage that ministries and agencies were at with their programs to provide appropriate guidance at that level. Second, we reasoned that recommendations addressed to ministries and agencies can only be of value if they are consistent with government's intentions and strategies for managing its contaminated sites. And third, given that a government-wide strategy does not exist, detailed recommendations cannot therefore be linked to clearly established performance expectations.

I believe implementing a government-wide program must start at the corporate rather than the ministry level. The government —not the ministries and agencies—needs to set clear direction and expectations if there is to be a consistent, coordinated government-wide approach to dealing with contaminated sites. I encourage the government to examine our recommendations and to work with organizations to establish an approach that will lead to rapid implementation of an efficient and effective program for managing contaminated sites.

1. **We recommend the government identify a lead agency with the appropriate authority to oversee the development and implementation of a comprehensive and coordinated government-wide policy framework for management of its contaminated sites.**

2. **We recommend the government ensure that the information needed to develop sound management plans is obtained, and that management plans are developed and used as the basis for making resource allocation and funding decisions. The process should include a province-wide prioritization of contaminated sites so that scarce funds can be allocated where they will achieve the greatest reduction in risk. In the long term, government will need to ensure performance targets for management of contaminated sites are balanced with the staff and other resources it allocates to meeting those expectations.**

3. **We recommend the government establish an accountability framework for its contaminated sites, one that requires the disclosure of financial liabilities, expenditures and information about the accomplishments of its management of contaminated sites. Both government-wide and ministry/ agency-specific information should be provided.**

Detailed Report

Background

Defining contaminated sites

In British Columbia, a contaminated site is defined in section 26 (1) of the Waste Management Act as

> an area of land in which the soil or any groundwater lying beneath it, or the water or the underlying sediment, contains
>
> (a) a special waste, or
>
> (b) another prescribed substance in quantities or concentrations exceeding prescribed criteria, standards or conditions.

Thus, a contaminated site is one in which substances that pose risks to human health or the environment occur at concentrations above levels specified in regulations. The health or environmental risks are determined through a rigorous process that begins with a survey of the historical land use activities at the site in question. This survey is then followed by an environmental site assessment that involves such techniques as soil and water field sampling and laboratory analysis to determine the type and level of contamination present. Finally, the level of contamination present is assessed against the prescribed criteria, standards or conditions. Appendix A shows a schematic diagram of the steps used for assessing and managing contaminated sites.

Since the late 1980s, a major national effort has been underway to develop an effective approach for dealing with contaminated sites. These efforts have been directed by the Canadian Council of Ministers of the Environment (see sidebar).

> The Canadian Council of Ministers of the Environment (CCME) is an intergovernmental forum that discusses and undertakes joint action on environmental issues. Its members are the environment ministers from the federal, provincial and territorial governments.
>
> The CCME promotes cooperation and coordination on matters such as the management of waste, air pollution and toxic chemicals. Members propose and develop national environmental guidelines, criteria and objectives with the aim of achieving a high level of environmental quality across the country. The council does not have the authority, however, to impose proposed suggestions on its members or create or enforce legislation. Each jurisdiction determines the degree to which it will adopt CCME proposals.
>
> From the late 1980s to 1997, the CCME was very active on issues surrounding contaminated sites. Its activities resulted in the development of nine tools and guidance documents to address these issues (see Exhibit 3).

Background

Defining contaminated sites

In British Columbia, a contaminated site is defined in the Environmental Management Act as:

> an area of land in which the soil or groundwater has been contaminated by a prescribed substance in quantities or concentrations exceeding prescribed criteria, standards or conditions.

These contaminated sites are also referred to as brownfield sites. Brownfield sites are abandoned or underutilized properties where real or perceived environmental contamination prevents redevelopment. Usually, the level of contamination is assessed against the prescribed criteria, standards or conditions. Typically, a historical investigation of the site's past land use is undertaken, followed by sampling and laboratory analysis to determine the type and level of contamination present. Finally, the level of contamination present is assessed against the prescribed criteria, standards or conditions. Typically, a historical investigation of the site's past land use is undertaken, followed by sampling and laboratory analysis to determine the type and level of contamination present. Finally, the level of contamination present is assessed against the prescribed criteria, standards or conditions. Typically, a historical investigation of the site's past land use is undertaken, followed by sampling and laboratory analysis to determine the type and level of contamination present. Finally, the level of contamination present is assessed against the prescribed criteria, standards or conditions.

Since the late 1990s, a large national effort has been underway to address and clean up contaminated sites. These efforts have been driven by the Canadian Council of Ministers of the Environment and by

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>
> The CCME promotes cooperation and consultation on issues such as management of water, air pollution and waste. Activities include the development of environmental quality guidelines, objectives and standards. The council also develops and implements national programs and reports on the state of the environment. The CCME's activities are carried out by the Canadian Environmental Protection Act, which provides the CCME's mandate.

Liability for contaminated site clean-up

The Waste Management Act and its related Contaminated Sites Regulation (which came into force in 1997) assign liability for the cost of cleaning up contaminated sites according to two main rules:

- First, the Act adopts the "polluter pays" principle, holding those who cause contamination responsible for paying to clean it up. Accordingly, the Act lists those who may be considered responsible in this regard. They include, among others, past and present owners, operators, producers and transporters.
- Second, the Act states that a responsible person is absolutely, retroactively, jointly and severally liable for the clean-up costs of a contaminated site. Under absolute liability, no defence of due diligence (a measure of legal defence expected by a reasonable person) will be accepted. Retroactive liability means that a responsible person is liable for clean-up of contamination that occurred in the past. And, joint and several liability mean that one or more responsible persons are liable for the entire clean-up cost if other responsible persons cannot or will not pay their share.

Taken together, these rules mean that a responsible person, whether or not that person contributed to contamination of a site, may have to pay all the clean-up costs. For example, an owner of a property leased to a tenant who caused contamination would be liable if the tenant was unable or unwilling to pay.

In British Columbia, where over 92% of the land base is Crown land, the Province can become responsible for the clean-up and restoration of contaminated sites in several ways. Where government operations such as forestry offices or highways yards create contaminated sites, the Province's responsibility is obvious. Where a company obtains a lease or tenure on Crown land and either inherits or creates a contaminated site, the Province may have to assume the related liability if the company becomes insolvent. And, where economic development activities have left "orphan" contaminated sites, the Province has a legacy responsibility. Such sites are ones for which responsible parties cannot be found because, for instance, they have gone bankrupt, left the province,

or are unwilling or unable to accept responsibility. Because the sites still need to be cleaned up, the Province may have to assume the costs for public interest reasons.

The history and causes of site contamination in British Columbia

As elsewhere in the world, there is increasing recognition in British Columbia of the potential risks to human health, the environment, property values and economic opportunities from high concentrations of soil and water pollution. Indeed, the Province first became seriously involved with contaminated site issues during the sale of the Expo '86 land site, a former industrial area located in downtown Vancouver. Historically, this area has been home to various secondary manufacturing activities, including wood treatment, metal fabrication and coal gasification.

Site contamination can result from a variety of land use activities, such as industrial processes, resource extraction, hazardous materials handling, storage and disposal. Soil and water contamination can also be directly attributed to chemical spills, or indirectly by the leaching of chemicals into the ground and the migration of contaminated groundwater.

In British Columbia, a wide range of commercial, industrial, mining and waste disposal practices going back decades has been carried out on public and private lands (Exhibit 1). Many of these operations have left a variety of contaminating substances—notably chemicals and metals—present in the soil, surface water and groundwater at numerous locations around the province. These contaminants can be present at levels that threaten the environment and human health.

Contamination is not always evident to the eye. In urban areas, a fence around a property with warning signs posted will indicate a problem even though the contaminants are not visible. In a remote site where the contaminant is in the ground, the only sign of that contamination may be the remains of some past development activities and a disturbed environment. In other cases, the signs can be more evident. For example, run-off containing copper and iron compounds from an abandoned mine near Mount Washington on Vancouver Island has formed two colourful streams: one runs red with iron compounds and one runs blue with copper compounds. The compounds in the streams are affecting aquatic life.

Exhibit 1

Sources and types of contaminants at sites in British Columbia

Sources of Contaminants	Types of Contaminants
• gas stations (underground and above-ground storage tanks)	• toxic or carcinogenic chemicals such as arsenic, cyanide, benzene
• chemical processes	• toxic or phytotoxic metals (poisonous to plants or aquatic life) such as lead, zinc, chromium, nickel, copper
• landfills	• organic materials such as oils, solvents
• waste disposal	• corrosive substances such as acids, sulphates
• scrap yards	• asbestos
• metal finishing and cleaning	• radioactive substances
• iron, steel and metal processing	• coal tars
• mining	• toluene extract, creosols
• wood treatment	• sulphur
• oil and gas exploration	• polychlorinated biphenyls (PCBs)
• pulp and paper mills	• polyaromatic hydrocarbons (PAHs)
• farming	• pesticides and herbicides
	• dioxins and furans

Source: Compiled by Office of the Auditor General of British Columbia

Over time, environmental standards and practices, including those pertaining to contamination prevention and clean-up, have become more stringent as better information on the environmental and health risks from chemical and other contaminants becomes available. Under today's more stringent regulations and higher levels of environmental awareness, environmental contamination should be a result of accident rather than of ignorance, as it was in the past.

Why contaminated sites need to be identified and managed

Why should the government concern itself with identifying and managing contaminated sites on Crown land? There are a number of important reasons:

1. Human health: The potential effects of contamination on human health range from minor ailments to life-threatening

Exhibit 1

Sources and types of contaminants at sites in British Columbia

Sources of Contaminants	Types of Contaminants
▪ gas stations (underground and above-ground storage tanks) ▪ chemical processes ▪ landfills ▪ waste disposal ▪ scrap yards ▪ metal finishing and cleaning ▪ iron, steel and metal processing ▪ mining ▪ wood treatment ▪ oil and gas exploration ▪ pulp and paper mills ▪ farming	▪ toxic or carcinogenic chemicals such as arsenic, cyanide, benzene ▪ toxic or phytotoxic metals (poisonous to plants or aquatic life) such as lead, zinc, chromium, nickel, copper ▪ organic materials such as oils, solvents ▪ corrosive substances such as acids, sulphates ▪ asbestos ▪ radioactive substances ▪ coal tars ▪ toluene extract, creosols ▪ sulphur ▪ polychlorinated biphenyls (PCBs) ▪ polyaromatic hydrocarbons (PAHs) ▪ pesticides and herbicides ▪ dioxins and furans

Source: Compiled by Office of the Auditor General of British Columbia

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Why contaminated sites need to be identified and managed

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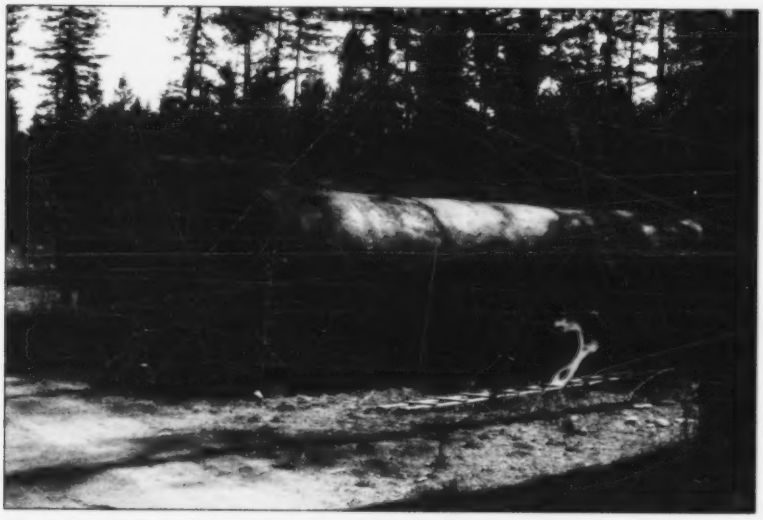
1. Human health: The potential effects of contamination on human health range from minor ailments to life-threatening

diseases such as cancer. Children are often most at risk from exposure to contaminated soil, air, water and food. For example, the Ministry of Water, Land and Air Protection recently identified blood lead levels in children as a potential health problem.

2. Ecosystem health: Contaminated sites may release substances that can kill or impair the reproductive capabilities of wildlife and contaminate ecosystems. For example, acid rock drainage at the closed Britannia Mine located 50 km north of Vancouver has been found to be toxic to fish and has harmed salmon migration in nearby rivers. After many years of uncontrolled drainage, several kilometres of this marine shoreline ecosystem near the former mine site have become severely polluted from the mine's metal contaminants.

3. Potential significant financial liabilities: Identifying and managing contaminated sites may help the Province avoid or limit the high cost of clean-up. In some cases, the Province is already liable for indemnities related to land transactions, such as pending First Nations negotiations, and to orphaned and abandoned sites assumed by the Province. Clean-up of such sites can be costly. For example, the remediation cost for the Britannia Mine is estimated at $75 million, of which the



Courtesy: David Chung

Faulty storage stanks can leak contaminants into surrounding soil

Province is contributing $45 million; and, in its divestment of Skeena Cellulose, the Province agreed to bear $30 million of the potential environmental clean-up cost.

4. Fiduciary duties: Under common law, the Province may have certain duties of care in relation to land. For instance, as a land user, the Province must exercise reasonable care to avoid any foreseeable risk of damaging the environment or harming people. And as a land owner, the Province has a duty to give adequate warning of its knowledge on the condition of the land to a purchaser or lessee. Recent amendments to the Contaminated Sites Regulation require the Province to notify neighbouring property owners should off-site migration of contaminants occur.

5. Environmental stewardship: The Province is responsible for being a good steward over all public land, and this means effectively managing contaminated sites. Furthermore, the Premier, in a letter to his ministers on June 25, 2001, stated that he expects the ministers "to be vigilant within your Ministry to assure our environmental stewardship is exemplary."

How government deals with contaminated sites

The Government of British Columbia has made managing contaminated sites a priority. The Ministry of Water, Land and Air Protection, for example, states that environmental protection is a ministry goal and one of the objectives for this goal is to "reduce/remove toxins and wastes that contaminate land." The government contributes to this objective in two ways. First, it acts as a regulator by setting the legal and administrative framework for managing contaminated sites. To do this, it has developed an extensive body of guidelines to assist property owners in carrying out their obligations on contaminated sites. Second, as a landowner holding title to 92% of the province, the government has the opportunity to show leadership by managing the contaminated sites on its lands in accordance with best practices. This second role is what our audit focused on: how government is managing those contaminated sites for which it is responsible as a landowner.

Background

In British Columbia, a number of ministries and other government agencies are involved in managing contaminated sites. The principal organizations are shown in Exhibit 2. These are the organizations we included in our examination.

Exhibit 2

Key government organizations with a role in contaminated sites management on Crown lands

Agencies

1. British Columbia Buildings Corporation is involved in contaminated sites issues as a result of ownership of a variety of Crown land and physical assets, including: correctional facilities, youth custody centres, forest district offices, nurseries, seedling facilities, highways yards, and salt storage facilities.
2. Land and Water British Columbia Inc. is involved with contaminated sites issues as a result of its responsibilities as the government's land agent and as the administrator of more than 200 land use permitting functions, including: Crown land development, water licensing, commercial ski resorts, fish farms, shellfish aquaculture, marinas, backcountry recreation, utility transmission corridors, and oil and gas development.
3. The Oil and Gas Commission and the Ministry of Energy and Mines (Energy Division) exercise shared responsibilities for contaminated sites issues as a result of past and current regulatory activities in the following areas: oil and natural gas exploration, well-head development, pipeline right-of-ways (gathering and transmission lines), production facilities, product transportation infrastructure (compressor and pumping stations), coal bed methane production, power generation and geothermal development.

Ministries

4. The Ministry of Energy and Mines (Mines Division) is responsible for contaminated sites issues related to the management of mine-generated wastes in the following areas: mining exploration and the mining of metal, coal, aggregate and industrial minerals.
5. The Ministry of Forests is involved in contaminated sites issues as a result of past and current regulatory activities in the following areas: district office maintenance facilities (fuels and oils), fire protection facilities (airtanker bases and chemical retardant storage facilities), logging camps (historic), nursery and seedling facilities (storage of herbicides and pesticides), recreational campgrounds and the issuance of special-use permits.
6. The Ministry of Sustainable Resource Management is involved in contaminated sites issues as a result of its mandate over Crown land ownership and land use administration. It has been named in a number of legal petitions involving contaminated sites or sites suspected of contamination on Crown lands in British Columbia.
7. The Ministry of Transportation is involved in contaminated sites issues as a result of its historic and current regulatory activities in the following areas: highway maintenance yards, gravel pits, salt storage facilities, highway right-of-ways and major highway construction.
8. The Ministry of Water, Land and Air Protection is the provincial agency responsible for regulating pollution issues in the province under the Waste Management Act. It maintains a site registry which is a list of the locations of contaminated sites or sites suspected of contamination.

Source: Compiled by Office of the Auditor General of British Columbia

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The governance framework has shortcomings

Managing contaminated sites is a complex endeavour that requires a structured, coherent approach. A clear governance framework, including comprehensive policies and clear assignment of roles and responsibilities, is a basic need. So too is central leadership to provide government-wide direction and coordination. We looked to see if the government had put in place such a framework and the supporting leadership.

We concluded that the government does not have a cohesive governance framework to guide and support contaminated sites management by government organizations. No clear government-wide direction or policy has been established. There is also no central coordination body which oversees ministry activities. As a result, the exchange of technical information, experiences and coordination between ministries is weak.

The British Columbia Buildings Corporation and the Ministry of Transportation are the exceptions, having taken the initiative and developed their own direction. Both of these organizations have implemented formal policies and guidelines, assigned roles and responsibilities, and structured operational programs, corrective actions, performance measures and expectations.

A comprehensive policy does not exist

The provincial government does not have a formal government-wide policy for contaminated sites or Crown land. Many staff with contaminated sites management responsibility told us that they need better policy guidance. We use the term "policy" to refer to a statement by government of a course of action it has adopted or proposed. A comprehensive policy for contaminated sites management should provide a clear statement of government's intentions, identifying:

- the aim, goals and objectives of the policy
- overall responsibility
- responsibilities of key ministries/agencies
- any coordinating role/function
- the expectations placed on ministries/agencies
- the accountability expectations, and
- the legal authority for the policy

A contaminated sites policy had been under active consideration since 1995 by the Crown Lands Branch of the former Ministry of Environment, Lands and Parks (Environment). When the government reorganized in June 2001, the Ministry of Sustainable Resource Management was established to carry on many of Environment's functions, including work on the government-wide policy. That policy still has not been completed.

When a policy does not exist or is not clear, there can be several problems: lack of clarity around roles and responsibilities, lack of coordination, lack of consistency of approach, and lack of understanding of what government really expects. During this audit, we found all of these problems. Resolving this issue is not easy. Involvement in government's establishment of a well-planned approach to managing its contaminated sites

Some ministry and agency policies are in place

In the absence of a government-wide policy, we examined how organizations were directing their efforts individually. The current land use regime in British Columbia, and thus contaminated sites management duties, are dispersed among several ministries and agencies. We expected these ministries and agencies would have policies to guide their programs.

However, we found only two organizations had documented their own policies for contaminated sites. Most ministries were relying on general guidelines developed by the Ministry of Water, Land and Air Protection or its role as administrator and regulator of the Waste Management Act and the Contaminated Sites Regulation. In the absence of ministry-level policies, we found a range of technical protocols for use by all those affected by the regulation. These guidelines, however, were not designed for use by ministries as substitutes for program-level policies. They are intended to provide guidance on site-specific issues rather than guidance for a program managing a portfolio of sites.

We believe ministries should approve their own specific policies for contaminated sites. Such policies would necessarily take into account the extent and type of sites each ministry must manage. Nevertheless, we also believe a government-wide policy should also be in place to guide ministries in setting their own

A positive story: Contaminated sites management by British Columbia Buildings Corporation

BCBC is the Crown corporation that provides accommodation and real estate services to the provincial government and the broader public sector. Managing over 3,500 buildings, BCBC's diverse portfolio ranges from law courts, office buildings and residential care institutions to forestry complexes, fish hatcheries, correctional centres and highways facilities.

The corporation manages the contaminated sites for which it is responsible in accordance with its corporate environmental policy and overall environmental management system. This includes:

- practising pollution prevention
- meeting or exceeding legal and regulatory requirements
- continually improving environmental practices to reduce exposure to environmental risk and liability
- enhancing awareness and understanding of sustainability issues among BCBC staff, clients and the community, and
- ensuring that environmental solutions make good business sense

BCBC's overall environmental management system was registered to the International Standards Organization (ISO) 14001 standard in 2000/01. This means that the system meets world standards and receives periodic review by an independent party to verify its components and its application.

As well, BCBC has a Pollution Prevention and Remediation Department that includes a contaminated sites management component that was formally set up in 1995. The department reports directly to the Vice President of the Property Management Group.

BCBC is fully aware of the risks and liabilities associated with its property holdings. After conducting an inventory of 12 properties in 1995 to gauge their degree of potential contamination, the corporation decided to undertake a scan of all its property holdings. The purpose was to identify those properties that could have become contaminated from past or ongoing activities or incidents, and then to determine if additional investigation was warranted. This exercise resulted in the identification of 253 sites where additional environmental investigation was deemed necessary. With the cooperation of client ministries, BCBC started a program to clean up or risk-manage these sites. It has also developed and implemented awareness programs based on "Environmental Housekeeping Guidelines" for some of its client ministries. These programs are intended to help client staff conduct their business in an environmentally responsible manner, thereby reducing the potential for new contamination to occur.

In 2001/02, BCBC allocated $20 million to its contaminated sites program. It expects all contaminated sites to be remediated or contained within three years. The corporation's Management Committee of senior executives meets quarterly to review all major issues of concern to the corporation, including the contaminated sites program.

Central focal point is lacking, but signs of initiative exist

A central point, or agent, is needed around which a government-wide approach can be developed. In the absence of such an agent, there is no assurance consistent practices are being applied or clear direction has been provided.

We found no such central focal point exists. No organization or unit has been designated to take on a central leadership role for government's contaminated sites. This has led to the inconsistent

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application of policy (where it exists) and practices, and a lack of complete information about government's contaminated sites. We noted, however, BCBC and the Ministry of Transportation have developed and implemented contaminated sites programs based on best management practices and guidelines.

Responsibilities are not always clearly defined

We found that responsibility for managing contaminated sites was only occasionally clearly defined.

In many organizations, pollution prevention has not been given adequate weight when land use designations are made. As a result, roles and responsibilities for management of contaminated sites within these organizations have not been clearly defined and the associated issues have therefore not received adequate attention.

Responsibilities between Land and Water British Columbia Inc. and the Ministry of Sustainable Resource Management require clarification

The principal organizations addressing Crown land issues in the province are the Ministry of Sustainable Resource Management and Land and Water British Columbia Inc. Through its mandate under the Land Act, the ministry is responsible for setting strategic policies regarding Crown land. All strategic policy decisions, guidelines, regulations and regulatory amendments are decided by the ministry. On the other hand, Land and Water British Columbia Inc. is the Crown corporation responsible for managing and making administrative decisions regarding the use of Crown land and water resources on behalf of the Ministry of Sustainable Resource Management.

As part of its responsibility, Land and Water British Columbia Inc. administers a portfolio of over 32,000 Crown land tenures and reserves under several land use programs (Exhibit 3). These programs include industrial, commercial, transportation and communications development activities. Some industrial activities and special use tenures are at higher risk of site contamination and pollution due to the nature of industrial processes undertaken and the hazardous substances that may be handled or stored.

Exhibit 3

Crown land tenure portfolio administered by Land and Water British Columbia Inc.

Land Use Program	Number of Tenures	Number of Number of Reserves	Total
Agriculture/Aquaculture	1,193	203	1,396
Industrial	5,680	2,391	8,071
Commercial	1,979	584	2,563
Community	1,069	209	1,278
Environment	7	4,583	4,590
First Nations	0	53	53
Miscellaneous Land Uses	31	836	867
Transportation and Communications	1,358	1,320	2,678
Residential	5,450	130	5,580
Utilities	4,518	35	4,553
Other	846	26	872
Total	22,131	10,370	32,501

Source: Based on information provided by Land and Water British Columbia Inc.

We noted the ministry is working with Land and Water British Columbia Inc. to better define the respective duties, roles and responsibilities of the two agencies for contaminated sites management. Both organizations share responsibilities for policy and regulatory decision-making affecting Crown land tenures, reserves and land transactions, although Land and Water British Columbia Inc. retains responsibility for administering natural resource tenures at the operational level. At present, neither body has taken an active role in addressing contaminated sites issues in their portfolio. We think it is imperative they conclude their review and establish roles and responsibilities that are consistent with their mandates.

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Coordination of efforts among ministries and agencies needs to be improved

No one government body has been given the responsibility for ensuring that the government's contaminated sites activities are coordinated. As a result, there are no formal mechanisms in place for government-wide coordination on contaminated site matters. A lack of coordination can result in an inefficient and ineffective approach.

We were told many ministries relied on the Ministry of Water, Land and Air Protection for technical advice. In our opinion, however, this does not compensate for the lack of a formal coordinating mechanism. Although the ministry provides guidance and advice to ministries, it is not responsible for coordinating individual ministry or government-wide contaminated sites management plans on behalf of the Province.

In our view, managing complex environmental problems such as contaminated sites issues requires collective solutions and multi-disciplinary problem solving measures. This can be achieved with broad participation and cooperation by all provincial ministries, agencies and stakeholders.

We think the Province's performance could benefit from an inter-agency forum being created to coordinate land management and contaminated sites management practices.

Recommendation

We recommend the government identify a lead agency with the appropriate authority to oversee the development and implementation of a comprehensive and coordinated government-wide policy framework for management of its contaminated sites.

At the federal level, a Contaminated Sites Management Working Group was established in the summer of 1995. Fifteen federal departments or organizations are represented on the committee, which is intended to help develop a common federal approach to the management of contaminated sites under federal custody. This committee is viewed as the federal government body with responsibility for providing leadership on contaminated sites issues.

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The information needed to manage contaminated sites is incomplete

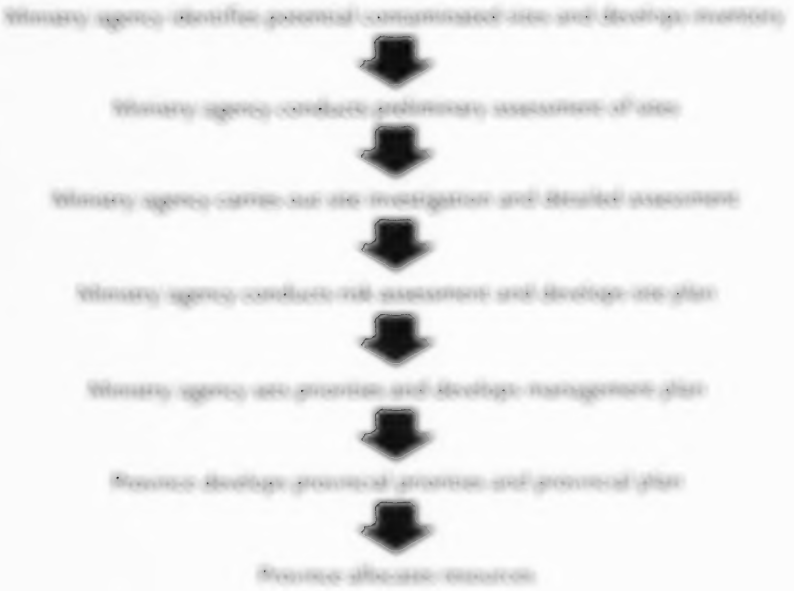
An effective contaminated sites management program relies on accurate, current information being collected, analyzed and used for decision-making. Exhibit 4 outlines the sequence of information gathering, data assessment, evaluation and planning that we expected the government to have in place.

We assessed the extent to which the government has collected comprehensive contaminated sites inventory information, as well as data on related site investigations and assessments. We also considered whether that information was being effectively analyzed to identify needed actions and summarized into management plans to guide government's activities.

Overall, we concluded that not enough information has been collected by government to allow it to understand what is fully required for contaminated sites management. Only two agencies

Exhibit 4

Information-gathering sequence


Ministry agency identifies potential contaminated sites and develops inventory
Ministry agency conducts preliminary assessment of sites
Ministry agency carries out site investigation and detailed assessment
Ministry agency conducts risk assessment and develops site plan
Ministry agency sets priorities and develops management plans
Province develops provincial priorities and provincial plan
Province allocates resources

Source: Compiled by the Office of the Auditor General of British Columbia

The information needed to manage contaminated sites is incomplete

have substantially completed their inventories, site investigations and assessments of active and potential contaminated sites on land under their jurisdiction. Some of the other organizations audited have achieved this. As a result, there is incomplete information about the nature of the remediation work required, the related costs and liabilities, and the resource allocation decisions that need to be made. And without information, few management plans have been developed.[1] Lacking plans and data, the Province is unable to develop a government-wide plan outlining its broad expectations, priorities and commitments.

Existing inventory is not complete and inventory systems are not integrated

Currently, data on contaminated sites is not collected in a systematic, consolidated manner by all land management agencies. What site inventory information is collected varies as to completeness and accuracy agency-wide. For example:

- The Ministry of Transportation has completed an inventory of highways yards, salt sheds and gravel pits.
- BCRC has a site inventory for properties it administers for the ministries of Transportation, Forests, Attorney General, Public Safety and Solicitor General, and Children and Family Development.
- The Ministry of Forests' inventory program is being developed and has over 300 sites in its preliminary database.
- The Ministry of Energy and Mines has completed a historical mine inventory of over 1,000 former mine sites and has also identified 42 significant metal leaching/acid rock drainage mines. Exhibit 7 shows the locations of these latter mines.
- The Oil and Gas Commission does not have an inventory program.
- The Ministry of Sustainable Resource Management has delegated land administration to Land and Water British Columbia Inc. which currently has no program to identify and inventory potential sites.

The number of known or potential contaminated sites could be more than 5,000. This does not mean, however, that all these sites pose significant environmental, health or other public safety risks.

The information needed to manage contaminated sites is incomplete

We found all existing inventory information is maintained on individual databases by each organization. These databases cannot be linked to create a central database of contaminated sites inventory. There are two approaches governments can consider to address this inventory problem. One is to ensure all organizations capture information in their systems in a standardized way so that the data can be consolidated government-wide. The other is to

Exhibit 2

Nine sites requiring mitigation or further assessment

Source: Ministry of Energy, Mines and Petroleum Resources

establish one database that all organizations can use for their inventory needs.

It is up to government to decide which approach best meets its requirements. Whichever one it adopts, there must be a capability for accessing the information, comparing and analyzing it, and reporting it at different levels of aggregation. Without an integrated, well-maintained information system for recording data on the likelihood or extent of site contamination, the risk is high of such information being lost or overlooked when staff or duties change—as is now occurring under the present government's workforce adjustment. The result could be management making decisions about property, investment and valuation issues on the basis of inadequate knowledge.

Evaluation and assessment of existing inventory of contaminated sites is incomplete

The federal government's coordinated approach to contaminated sites inventory

Effective July 1, 2000, all federal departments with contaminated sites are required to have and maintain a database of their contaminated sites. This information is to be provided to Treasury Board Secretariat for incorporation into a central Federal Contaminated Sites Inventory. The government allocated $30 million to assist departments in assessing, identifying and classifying their sites. In the summer of 2002, Treasury Board Secretariat published the inventory information. It shows, located in British Columbia, 237 contaminated sites for which federal departments are responsible.

To understand the degree of contamination and the potential impacts and risks associated with its contaminated sites, the Province needs to evaluate and assess each site. To do this in a consistent manner requires the design and application of guidelines and procedures that reflect current best practices.

We concluded that although the Province has good guidelines and references available to it, these tools are not being applied to the degree they should. As a result, government is unaware of the types and extent of contamination it has to manage for in its known inventory.

Essentially, two levels of information are required. First is an inventory of contaminated sites identifying the types of contamination present. Second is information to characterize the sites. What are the contaminants of most concern and in what concentrations? How mobile are the contaminants? What is the hydrology of the site? Answering these questions requires several stages of identification, assessment and investigation to confirm or refute the potential of site contamination. This process involves the sampling and chemical analysis of soils, sediments, surface water and groundwater.

We found a variety of guidelines and tools exist which could provide the government with the opportunity to conduct appropriate site evaluations and assessments. Nationally, the Canadian Council of Ministers of the Environment has published many useful documents as identified below in Exhibit 6.

Other sources of information for managing contaminated sites are also available (see Appendix B).

At the provincial level, the Ministry of Water, Land and Air Protection, as a regulatory agency, has issued a series of technical manuals and guidelines intended for use in British Columbia. As noted earlier, BCBC and the Ministry of Transportation have developed their own guidelines based on best management practices.

Despite the availability of these tools, however, we found that they have not been applied to the existing inventory of sites in a proactive fashion. Many of the existing sites still need to be assessed.

Exhibit 6

Guidance and tools developed by the Canadian Council of Ministers of the Environment

- National Classification System for Contaminated Sites (1992)
- Guidance Manual on Sampling, Analysis, and Data Management for Contaminated Sites (1993)
- Environmental Code of Practice for Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products (1993)
- Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products (1994)
- Subsurface Assessment Handbook for Contaminated Sites (1994)
- Guidance Manual for Developing Site-specific Soil Quality Remediation Objectives for Contaminated Sites in Canada (1996)
- A Protocol for the Derivation of Environmental and Human Health Soil Quality Guidelines (1996)
- A Framework for Ecological Risk Assessment: General Guidance (1996) and Technical Appendices (1997)
- Guidance Document on the Management of Contaminated Sites in Canada (1997)
- Recommended Canadian Soil Quality Guidelines (1997)

Source: Compiled by the Office of the Auditor General of British Columbia

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Another problem we noted is that assessment data on a number of sites is not being collected by some agencies. As a result, the type and extent of contamination of many of these identified sites are unknown. For example, the Ministry of Water, Land and Air Protection maintains a site registry of suspected and contaminated sites in British Columbia in both electronic format and paper records. The registry identifies the basic information of a contaminated site such as location, legal land description, latitude/longitude, address, past and present site uses, historical site events, investigation reports and milestones in the remediation process. Approximately 7,000 land holdings are identified, about 480 of which are on Crown land. The rest are on private land.

As illustrated in Exhibit 7, a significant percentage of these Crown land sites have "inactive/no further action" or "unknown/other" status.

Until government carries out these assessments, the remediation needs and potential liabilities and cost estimates are unknown. For some sites, government's financial outlay may be nominal. For others, such as the sites of former mines, the costs may run into many millions of dollars and require many years of government's involvement.

Exhibit 7

Status of Crown land sites on the Ministry of Water, Land and Air Protection's site registry

Status	Number of sites	Percent
Inactive remediation completed	17	3%
Active under assessment	62	13%
Active assessment completed	11	2%
Active under remediation	92	19%
Active remediation completed	3	1%
Inactive/no further action	199	41%
Unknown/other	105	21%
Total	489	100%

Source: Based on information provided by Land and Water British Columbia Inc.

The information needed to manage contaminated sites is incomplete

Matching of resources to performance expectations can be particularly difficult during a period of tightening budgets. This makes the availability of good information about program needs all the more important for contaminated sites management.

Few management plans have been developed

Contaminated sites management plans are required to provide senior managers and policy-makers with the information they need to understand their organization's proposal for managing its problem sites. Exhibit 8 outlines what details such a plan should contain. We found that, with the exception of BCBC and the Ministry of Transportation, organizations have not developed management plans for their contaminated sites program.

Exhibit 8

Content for a contaminated sites management plan

Background

- Background data (nature of operations, organization, other contextual information)
- Inventory of known or suspect sites
- Organization structure for management of contaminated sites

Planning information

- Planning approaches and processes for identifying scope and cost of managing new sites, and for identifying risk management and remediation projects to be implemented
- Criteria for project prioritization
- Approval mechanisms, including delegated authorities

Financial information

- Planned funding for a 5-year period
- Projects to be implemented based on available and forecast funding

Miscellaneous

- Identification of relevant policies and their effects on the program
- Identification of how results will be measured and reported
- Identification of barriers to success—staffing, technological, authority, funding
- Opportunities for partnerships, coordination, and joint action with others

Project lists and cash flow

- List the actions and cash flows for each project or class of project to be implemented over the next five years
- Include data beyond the five year horizon, if available

Source: Compiled by the Office of the Auditor General of British Columbia from a Government of Canada "Best Practices Advisory"

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Source: Compiled by the Office of the Auditor General of British Columbia from a Government of Canada "Best Practices Manual"

We understand that, without complete inventories and site assessments, ministries and agencies have been reluctant to develop comprehensive management plans. However, we also believe management plans are required if government is to understand how much is known and planned for, and what still needs to be done to have a full understanding of the extent of contaminated sites management needs. It is therefore critical that, upon initiating a management plan, organizations propose timetables to complete all necessary inventory and site assessments, as BCRC and the Ministry of Transportation have done.

Without adequate plans, the Province also exposes itself to a number of potential environmental risks, liabilities and costs. These include the following:

- Despite wanting to be a responsible government, the Province may fail to ensure that all ordered and high risk sites are the first to be remediated.
- Loss of public confidence in government's ability to protect the environment may result if the government does not discharge its stewardship over Crown lands with the due diligence expected of a prudent landowner.
- The potential share of clean-up costs for contaminated sites on Crown land may constitute an unrecognized liability that could materially affect the government's reported financial condition.
- The contamination of provincial Crown lands may hinder the government's plans to transfer land and government operations to third parties, including those involved in land claims settlements.
- The government may lose revenue on the selling of Crown lands. For example, the Province recently had experienced difficulty in trying to sell a contaminated property in the Lower Mainland.

Skilled resources are available, but the long-term resources requirement is indeterminate

Ministries and agencies responsible for contaminated site management rely on skilled staff and consultants to carry out their contaminated sites programs. Managing contaminated sites is a relatively new field. New techniques for risk managing, remediating and monitoring are being developed and experimented with on a regular basis. If the best science is to be applied by government staff, they must be given opportunities to upgrade their skills.

Most staff rely on their professional training to provide them with an understanding of soil science and hydrogeology, the basic knowledge requirements needed to work with contaminated site issues. Other than a few exceptions, we found most personnel had not received any formal training in contaminated sites risk and liability issues.

Where there budgets accommodate it, ministries and agencies hire outside consultants and contractors to carry out almost all phases of the investigation, assessment and remediation work. Many, however, are unable to do this.

Ministries and agencies we examined recognize there is a need to better understand resource requirements. Dealing with matters such as historic mines and other types of contaminated sites can involve a long-term commitment of time and resources, including the allocation of dedicated staff to the project if the remediation objectives are to be met. We concluded most ministries and agencies still need to determine the extent of the problem before staffing and fiscal requirements can be addressed.

A provincial plan and priority setting are needed

Some of the expectations and procedures we described in the above sections – from information gathering and assessment to provincial planning, priority setting and funding allocation (Exhibit 8) – have been met to any significant degree.

The information needed to manage contaminated sites is incomplete

We recognize significant long-term funding may be required for the government to deal with its portfolio of contaminated sites. It is to obtain the best value from that spending, it must have a way of ensuring that scarce funds are targeted to the highest priority sites. And it is to identify government-wide priorities, it must rely on ministries to provide the information needed for planning and priority setting. With none of these conditions in place, there is little assurance that scarce funds will be spent on the highest priority sites.

The information gaps in inventory, assessment and ministry-level management plans have precluded the development of a government-wide plan. As a result, government's intentions regarding its contaminated sites are not clearly spelled out. In the absence of such a plan, government cannot provide legislators and the public with information about its expectations regarding timelines, resource needs and allocations, and performance.

Recommendation

We recommend the government ensure that the information needed to develop sound management plans is obtained, and that management plans are developed and used as the basis for making resource allocation and funding decisions. The process should include a province-wide prioritization of contaminated sites so that scarce funds can be allocated where they will achieve the greatest reduction in risk. In the long-term, government will need to ensure performance targets for management of contaminated sites are balanced with the staff and other resources it allocates to meeting those expectations.

Reporting to legislators and the public needs to be improved

The Budget Transparency and Accountability Act requires ministries to prepare annual service plans and to report the August 15 of each year on their performance in relation to the expectations set out in their service plans.

In most ministries, however, these deadlines are rarely met. In 2010/11, only 10 of 19 ministries met the deadline for submitting their annual report to the Legislature. The annual report is intended to be a key vehicle for communicating what a ministry has accomplished in achieving the goals and objectives of the previous year and for identifying future intentions.

Increasingly, there is also a perceived expectation that organizations in both the private and public sectors will provide broad reporting on their performance. In the private sector, a number of initiatives have required companies to report on environmental, social and economic factors. Broader reporting can be accomplished by expanding the scope of an annual report or by developing a separate report. For example, BC Hydro publishes a "Triple Bottom Line" report separate from its annual report, in which it reviews its performance along environmental, social and economic lines.

In the public sector, the federal government reports on key results in a corporate-wide perspective, addressing all of government's commitments. Also, each ministry reports on its key results in a ministry perspective, as the role each organization is responsible for managing. We expected to find full reporting of financial and operational information.

However, what we found was inadequate accountability for the management of provincial commitments, both at the level of government overall and for individual ministries. In our view, this reflects the lack of central guidance for government and the lack of clear performance objectives in most of the organizations we examined.

Information gaps preclude government from identifying the full liability it may be facing

In the government's Summary Financial Statements, the government acknowledges its inability to provide complete information about the Province's liability. Volume 3 of Government and Government in the Summary Financial Statements states:

The province is responsible for the environmental clean-up of numerous contaminated sites in the province. Based on preliminary environmental audits of some sites, a liability has been recorded based upon the minimum estimated clean-up costs, where an estimate has been provided. Maximum estimated clean-up costs for sites under evaluation could increase the liability by $90 million at March 31, 2002. Many other sites remain to be evaluated; this future liability is not determinable.

Although the note refers to the recording of a liability, the amount recorded is not clearly identified in the financial statements because it is part of a larger figure, and is not separately disclosed. Readers are unable to tell whether the amount recorded is $10 million, $100 million or some greater amount, and thus they cannot put the potential $90 million increase into proper context. Although the financial statements are in compliance with financial statement reporting requirements, accounting guidelines also suggest that, in some circumstances, disclosure of the amount recorded as a liability is desirable. Based on the amounts involved, we believe that clear disclosure would be the best course to follow in the future.

We noted that the recorded amount of clean-up liabilities for the Province was $144 million in 2001/02 (Exhibit 9).

Exhibit 9

Environmental clean-up liabilities included in the 2001/02 B.C. Public Accounts

	Amount ($millions)
Skeena Cellulose Inc.	30
Ministry of Transportation Sites	26
Britannia Mine (Appendix C)	75
Ministry of Sustainable Development Sites	13
Total	$144

Source: Compiled by the Office of the Auditor General of British Columbia

Reporting to legislators and the public needs to be improved

Clearly, incomplete inventories and assessments prevent the government from reporting fully the potential liability it faces. The federal government has recently implemented such a policy, requiring a complete accounting of the liability related to contaminated sites (see sidebar).

Government-wide reporting on the Province's management of contaminated sites does not exist

For government as a whole, no one document synthesizes provincially the inventory of sites, the status of their assessment and remediation, and the expenditures made on remediation activities in the past year. The absence of such operational reporting concerns us.

We noted the government has reported in other ways on the issue of contaminated sites in the province. Since 1998, it has been issuing a bi-annual *Environmental Trends* report. The last one, *Environmental Trends in British Columbia 2000*, presented information on 15 key environmental indicators and described how conditions were changing over time. A brief section also contained information on all known contaminated sites in the province that were under remediation (both private and public).

Federal policy on accounting for costs and liabilities related to contaminated sites

In November 1996, the Auditor General of Canada reported that the federal government did not have a complete picture of its environmental risks, costs and liabilities arising from federal contaminated sites. Federal departments had identified some 5,000 contaminated sites, and estimates placed the federal liability at $2 billion, excluding the costs of dealing with radioactive waste.

The Auditor General recommended that government develop an accounting policy that "defines a contaminated site and an environmental liability, and sets out when and how such liabilities should be recorded in the Public Accounts." Following up on that recommendation, the Treasury Board Secretariat issued a Policy on Accounting for Costs and Liabilities Related to Contaminated Sites, which came into effect on April 1, 2002.

The intent of the policy is to ensure that "all costs and liabilities related to management and remediation of environmentally contaminated sites, for which the Government of Canada has ongoing responsibility, are accounted for and reported in the financial statements of the government in the fiscal year in which environmental damage is incurred, or in the fiscal year in which costs and liabilities are identified."

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Reporting to legislators and the public needs to be improved

According to the 2000 report, 5,122 sites had been identified in British Columbia, 867 of which were cleaned up by 1999. When we were writing this audit report, Environmental Trends for 2002 had not yet been published. More current information on contaminated sites, however, is provided in the 2001/2002 Ministry of Water, Land and Air Protection annual report. It states that 139 sites were cleaned up to provincial standards in 2001, bringing to 1,332 the total number of sites cleaned up since the ministry started collecting data in 1988. However, the report does not show how many additional sites have been identified. As a result, the actual level of progress is indeterminate.

We know the provincial database which provided information for both of those reports includes information on government's contaminated sites. The Province therefore has the ability to report on its own performance in cleaning up its known inventory of sites. We believe the government should be reporting with a government-wide perspective on its progress in managing its contaminated sites. The federal government's approach could be used as a model (see sidebar).

Public reporting by ministries and agencies is also incomplete

As we noted earlier, ministries and agencies have generally not completed assessments of remediation needs and therefore have few reliable estimates to report. The information that has been provided is generally not extensive. Very few of the ministries and agencies included any information on their contaminated sites in their annual reports.

Reporting on contaminated sites by the federal government

In the federal government, the Contaminated Sites Management Working Group has been reporting annually on its activities since the 1996/97 fiscal year. In addition to describing federal policies and initiatives for managing contaminated sites, the annual reports contain brief progress reports from individual departments. Each department reports on its approach to contaminated sites management, the progress achieved to date, the information it provides, and the linkages between its contaminated sites management program and the department's environmental management system and/or sustainable development strategy. The report provides legislators and the public with one location for information about the federal approach and its status.

A Government of Canada "Best Practices Advisory" for contaminated sites recommends that departments "consider providing a report on the state of their contaminated sites and the department's efforts to manage them in the fall Departmental Report tabled in Parliament or in their Sustainable Development Strategy document, as appropriate."

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Reporting to legislators and the public needs to be improved

Only BCRC showed an estimate of its contaminated sites liabilities—$20.3 million for its outstanding remediation costs—in its 2001/02 annual report. The corporation also provided the following operational information:

> *Risk management activities associated with contaminated sites continue to demonstrate progress. Remediation is now complete or deemed to be not required on 44 per cent of applicable sites, and all sites identified as "high priority" have been remediated or are under remediation.*

As well, the annual report included a graph identifying progress in terms of percent completed over a three-year period.

We noted earlier the lack of ministry/agency co-ordination of contaminated sites activities. This carries through to reporting as well. For example, we found the Ministry of Water, Land and Air Protection, in its 2001/02 annual report, identified an expenditure of $45.9 million for the Britannia Mine remediation in 2001/02. No additional information was given about any future liabilities for either Britannia or other government contaminated sites. In the Ministry of Energy and Mines' 2001/02 annual report, however, the ministry reported it was responsible for managing the remediation plan at the Britannia Mine site, it planned to have

Courtesy: Oil and Gas Commission

Broken valve can result in contamination

an acceptable level of discharge in place by 2005/06, and the remediation plan is on schedule. Readers would have to link the information in two reports to understand the status of the Britannia Mine remediation (Appendix C). The current presentation does not make clear that the remediation exercise is a joint effort between the two ministries.

We did not find any reporting on contaminated sites activities in any of the other ministry annual reports we reviewed.

Recommendation

We recommend the government establish an accountability framework for its contaminated sites, one that requires the disclosure of financial liabilities, expenditures and information about the accomplishments of its management of contaminated sites. Both government-wide and ministry/agency-specific information should be provided.

Other Matters

During the course of our audit, two additional matters related to contaminated sites management came to our attention:

- the inadequacy of financial security held by the Province for environmental restoration and remediation, and
- an emerging environmental issue in the oil and gas sector—naturally occurring radioactive materials.

Inadequate financial security and bonding requirements can put the Province at risk

The Province requires companies in the mining, oil and natural gas sectors to provide security or bonding for development activities where the potential for environmental damage and contamination exists. Bonding protects the Province from having to incur additional liabilities when restoration efforts are required once an industrial activity is completed on Crown land. Bonding in the amount of estimated restoration costs protects the Province; bonding that is less than the estimated cost puts the Province at risk.

For the sites identified as requiring bonding, we found the bonding amount held by the Province is substantially less than the estimated remediation costs. This exposes the Province to considerable financial risk. We also found legislators are not provided with information about security deposit levels, shortfalls and risk levels accepted by the Province. As a result, it is not clear whether the risk assumed by the Province is at an acceptable level.

The Ministry of Energy and Mines has a significant security gap

In the mining sector, the Ministry of Energy and Mines has required financial security from mine operators for over thirty years. Section 10 of the Mines Act requires an owner, agent or manager to apply for and receive a permit approving a mine plan and a program for the protection and reclamation of the impacted land and watercourses. Under the Mines Act, the Chief Inspector of Mines can determine the amount and type of security required. Such bonding may also be needed to satisfy the requirements of other provincial ministries for the protection and reclamation of land and watercourses affected by the mine.

Iron staining behind it

Recent amendments to the Waste Management Act have increased the importance of these bonding requirements as a measure to protect the interests of the Province. The Act was amended in May 2002 to allow for greater flexibility in issuing permits. Additional changes to it have altered the enforcement powers of the Ministry of Water, Land and Air Protection managers by restricting them from issuing pollution prevention and pollution abatement orders to certain type of mining facilities.

The amendments to the Act established a single agency for approving all mining permits (the Ministry of Energy and Mines), which includes the issue of bonding for mine sites. The amendments also bring the liability provisions for remediation of contamination more in line with the Mines Act (except for historic mine sites). These changes make the issue of an adequate security or performance bond important in safeguarding the Province from liability risks because, under the Mines Act, only the current owner of a mine can be required to restore and remediate the site, or be held liable for such costs.

An important element of the Minister's role is that of ensuring the security of the assets of the British Columbia Pension Corporation. If a crisis or a natural disaster or other environmental hazard were to occur, the Minister would be responsible for ensuring the security of the assets of the pension funds. The current process for determining the amount of required security is sophisticated and rigorous. However, the Minister recognizes that security requirements may change over time. It is therefore important that the Minister's role in British Columbia's pension corporations remains relevant.

We also found that the Minister accepts less secure forms of security from large, strong companies that are viewed as financially strong, compared to what it accepts from smaller companies. For example, from one large company, the Minister accepted charges on equipment and buildings as security — a value that could reduce over time as the equipment and buildings depreciate. This does make it a questionable practice to use. However, given the long-term business assurance to validate market backing, and avoid potential challenges, we think the practice is a healthy precautionary. Given the existence of large companies can change, as illustrated by the recent failures of many notable American corporations. The volumes of material, metals and chemicals handled in the mining sector and the long-term project cycle which they can create contamination, suggest to us that adequate financial assurances are important to maintain and must the committed periodically.

We found the gap between estimated liability and actual security deposits has increased slightly over the past several years. In a 1996 report to the Minister, the British Columbia Utilities Commission on Mining reported that the estimated liability was about $75 million and security totalled about $163 million. That left an unfunded liability of $200 million. By 2000, the liability was estimated to be $400 million and the security totalled $172 million, a shortfall of $228 million.

The ministry's annual report does not refer to these issues. We believe it should as legislators can fully understand the level of risk being borne by the Province for contamination that remediation

The Oil and Gas Commission's security gap is unknown

The Oil and Gas Commission requires a bond of $7,500, or an amount it otherwise determines, for each company proposing to undertake a drilling program in British Columbia. The bond remains in effect until the company abandons all drilling programs and wells covered by the bond, and until the commission provides final location clearance in the form of a Certificate of Restoration (a well closure checklist identifying the status of land use prior to the well site being plugged).

The commission currently holds about $3.3 million in bonds from various companies. If an operator fails to meet the environmental responsibilities stated in the lease agreement, this bonding requirement ensures the availability of some funds to cover the cost of dismantling and removing equipment and of restoring the land to its former condition.

It is unlikely that the bonding requirements currently held by the Oil and Gas Commission are intended to fully cover the cost involved. However, the commission has not estimated the restoration costs and is therefore unable to provide information about the risk being borne by the Province.

A recent report by the General Accounting Office in the United States underscores the fact environmental clean-up costs can be substantial. According to the report, as a result of inadequate dismantlement and restoration practices, about 80 wells drilled on federal lands in Alaska remain improperly plugged and abandoned. The U.S. Bureau of Land Management estimates the total cost to properly plug and abandon these wells would exceed $100 million.

We therefore think it is prudent for the Oil and Gas Commission to assess thoroughly its performance bonding provisions. It may even want to consider another approach such as Alberta's industry-sponsored "Orphan Fund," which provides another means of mitigating against environmental clean-up costs (Appendix D). Either way, the associated risks and costs of abandoned wells and other oil and natural gas activities should be reviewed.

Courtesy Ronald Dart

Refuse dropped at road transfer station may create contamination

Naturally occurring radioactive materials (NORM)

Understanding of environmental risks is frequently impeded by imperfect or incomplete information. Many years can go by before an environmental impact resulting from an industrial activity becomes recognized. For areas where knowledge is just emerging, it is therefore a good idea for the government to undertake sufficient monitoring to understand the significance of the issue. One such issue is that of naturally occurring radioactive materials (NORM) in the oil and natural gas sector.

In Europe and the U.S., studies have recently found that oil and natural gas development, production and processing operations can cause NORM to accumulate at elevated concentrations in the processing and production equipment and facilities. This issue is relatively new for regulators in British Columbia and information to estimate the size and seriousness of the problem is lacking. The Oil and Gas Commission, the Ministry of Water, Land and Air Protection and the Province of Alberta are currently studying the matter with the aim of gaining a better understanding of the potential risks and options for dealing with NORM in the future.

We believe the government should continue to actively monitor this matter as a potential contaminated sites management issue so that it can establish an effective regime to manage the associated risks.

Note: The focus of our audit was on government's performance overall, not on individual ministries. In the absence of a clear provincial policy setting out overall responsibility, it was initially unclear to us who should lead in developing government's response to this audit. We sought direction from our advisors and others. In the end, the Deputy Minister for the Ministry of Sustainable Resource Management acknowledged that, since it is responsible for administering the Land Act, the ministry should lead in developing the response. We acknowledge the leadership shown by the ministry in taking that position.

Government Response

Thank you for the report "Managing Contaminated Sites on Provincial Lands." Please be formally advised that the Cabinet Committee on Environment and the Economy as well as the Deputy Ministers Committee on Natural Resources and the Economy have carefully considered the overall findings and recommendations of your report. This response is made on behalf of government.

In reviewing the report and our formal response, it will be important to note that the regulatory framework associated with management of contaminated sites is undergoing a review. A Government appointed expert advisory panel is currently reviewing the existing contaminated sites regulatory framework and will be making recommendations to government during late Fall of 2002. This on-going review has the potential to impact on government's responsibilities for managing contaminated sites on provincial lands.

The recommendations contained in the Auditor General's report provide a useful guide to improve management of contaminated sites on provincial lands. Accordingly, the ministries' response on behalf of government is summarized below:

1. *Recommendation: "We recommend the government identify a lead agency with the appropriate authority to oversee the development and implementation of a comprehensive and coordinated government-wide policy framework for management of its contaminated sites."*

   Ministries' action:

   The Ministry of Sustainable Resource Management will take the lead in developing government-wide policies that will guide management plans for contaminated sites on Crown land. The Ministry of Sustainable Resource Management will be informed by the Ministry of Water,

Land and Air Protection which will continue to act as the primary regulatory agency, in developing the guidelines. The Ministry of Water Land and Air Protection will continue to provide monitoring and enforcement.

2. *Recommendation: "We recommend the government ensure that the information needed to develop sound management plans is obtained, that management plans are developed and used as the basis for making resource allocation and funding decisions. The process should include a province-wide prioritization of contaminated sites so that scarce funds can be allocated where they will achieve the greatest reduction in risk. In the long term, government will need to ensure that performance targets for management of contaminated sites are balanced with the staff and other resources it allocates to meeting those expectations."*

   Ministries' action:

   The Ministry of Sustainable Resource Management will continue with the development of a central registry of Crown land and related database including contaminated site status as part of its mandate for integrated information.

   The Ministry of Sustainable Resource Management will develop a business plan for dealing with contaminated sites in early 2003. The plan will incorporate the revised regulatory framework under development by the Ministry of Water Land and Air Protection.

3. *Recommendation: "We recommend the government establish an accountability framework for its contaminated sites, one that requires the disclosure of financial liabilities, expenditures and information about the accomplishments of its management of contaminated sites. Both government-wide and ministry/agency-specific information should be provided."*

   Ministries' action:

   The Ministry of Sustainable Resource Management will work with the Office of the Comptroller General to include financial reporting requirements in the new guidelines to ensure that adequate information is compiled to facilitate liability assessment, risk management and performance reporting.

Glossary

Glossary

Clean-up	The removal of a chemical substance or hazardous material from the environment to prevent, minimize or mitigate damage to public heath, safety or welfare or to the environment.
Concentration	The amount of a chemical or other substance present in a given environmental medium.
Contaminant	Any physical, chemical, biological or radiological substance in air, soil or water that has an adverse effect; any chemical substance whose concentration exceeds background concentrations or which is not naturally occurring in the environment.
Contamination	The introduction into soil, air or water of a chemical, organic or radioactive material or live organism that will adversely affect the quality of that medium.
Criteria	Numerical standards used to determine acceptable concentrations of chemical substances in soil, groundwater, surface water and sediments, and which outline the suitability of a particular site for a specific land use or land use category. Criteria are also often referred to as guidelines.
Environmental management system	The component of a management system used to measure how an organization benchmarks operational and administrative issues from an environmental context. An environmental management system includes the following characteristics: organizational structure, planning activities, responsibilities, practices, procedures, processes and resources, implementing, achieving, reviewing and maintaining the environmental policy.
Environmental site assessment	A systematic due diligence process that includes studies, services and investigations to plan, manage and directly assess a contaminated site.
Groundwater	All subsurface water that occurs beneath the water table in rocks and geologic formations that are fully saturated.
Metal leaching and acid rock drainage	Naturally occurring chemical processes that can have significant negative impacts on the receiving environment if not adequately mitigated. The ability of certain rock types to generate acidic waters, particularly those rock types with elevated concentrations of sulphide minerals or their weathering products, and the exposure of these minerals to the weathering effects of oxygen and water.

Glossary

Remediation	The improvement of a contaminated site to prevent, minimize or mitigate damage to human health or the environment. Remediation involves the development and application of a planned approach that removes, destroys, contains or otherwise reduces the availability of contaminants to receptors of concern.
Restoration	Remediation, clean-up or other management of soil, groundwater or sediment to improve its quality and make the site suitable for the intended use.
Risk assessment	The scientific examination of the nature and magnitude of risk to define the effects on human and other receptors of the exposure to contaminants.
Risk management	The selection and implementation of a strategy to control risk, followed by monitoring and evaluation of the effectiveness of that strategy. Risk management may include direct remedial actions or other strategies that reduce the probability, intensity, frequency or duration of the exposure to contamination. The latter may include institutional controls, such as zoning designations, land use restrictions or orders. The decision to select a particular strategy may involve considering the information obtained from a risk assessment. Implementation typically involves a commitment of resources and communication with affected parties. Monitoring and evaluation may include environmental sampling, post-remedial surveillance, protective epidemiology and analysis of new health risk information. Ensuring compliance may also be involved.
Toxicity	The production of any type of damage, permanent or temporary, to the structure or functioning of any part of the body. The conditions of exposure under which toxic effects are produced—the size of the dose and the duration of the dosing needed—vary greatly among chemicals.

Appendices

Appendix A:
Steps for Addressing a Contaminated Site

NOTE: The steps shown above illustrate the complete process involved in identifying, verifying and remediating contaminated sites. There will be instances where some of the steps may not be required.

Step 1 - Identify Suspect Sites: Identifies potentially contaminated sites based on activities (past or current) on or near the site.

Step 2 - Historical Review: Assembles and reviews all historical information pertaining to the site.

Step 3 - Initial Testing Program: Provides a preliminary characterization of contamination and site conditions.

Step 4 - Classify Contaminated Site Using the CCME National Classification System: Promotes the use for future investigations and or remediation risk management actions.

Step 5 - Detailed Testing Program: Focuses on specific areas of concern identified in Step 3 and provides further in-depth investigations and analysis.

Step 6 - Reclassify the Site Using the CCME National Classification System: Updates the ranking based on the results of the detailed investigations.

Step 7 - Develop Remediation/Risk Management Strategy: Develops a site-specific plan to address contamination issues.

Step 8 - Implement Remediation/Risk Management Strategy: Implements the site-specific plan that addresses contamination issues.

Step 9 - Confirmatory Sampling and Final Reporting: Verifies and documents the success of the remediation/risk management strategy.

Step 10 Long-Term Monitoring: If required, ensures remediation and long-term risk management goals are achieved.

Source: Government of Canada, 1999. Contaminated Site Management Working Group. A Federal Approach to Contaminated Sites, p.7.

Appendix B: Guidance and Tools Developed to Provide Direction in Management of Contaminated Sites

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Appendix C: Britannia Mine

Acid rock drainage from the Britannia Mine is described as one of the worst point sources of metal pollution to the environment in North America. The impact on Howe Sound and local waterways, including the Squamish River, is considered to be significant.

The former copper mine is located at Britannia Beach, B.C., approximately 50 km north of Vancouver on the shores of Howe Sound, between Britannia Creek and Furry Creek. It began operation in 1905 and was closed in November 1974.

The main source of the problem is the naturally occurring metal sulphide ores which have been exposed to air and rain over 70 years of mining at the site. The resulting chemical and biochemical reactions produce a concentrated acidic, metal-contaminated water called acid mine drainage (AMD) or, more generally, acid rock drainage (ARD). AMD is discharged primarily from two tunnels at the Britannia Mine: 1) at the 2,200 level portal which discharges into Jane Creek and subsequently into Britannia Creek; and 2) at the 4,100 level portal which discharges to Howe Sound via a deep outfall.

In addition to the AMD from the portals, heavy metal contamination is also present in the soil and groundwater at the foreshore on Crown lands at the Britannia Creek fan, and in the

Courtesy: David Chong

Britannia Mine site

sediments of Howe Sound. Soil contamination at the foreshore and in the Britannia Creek fan is due to waste rock disposal, concentrate spills and tailings disposal. Sediment contamination in Howe Sound is a result of the estimated 40 million tonnes of tailings deposited over the life of the mine. A number of additional locations at the site are potentially contaminated.

Since 1993, the federal and provincial governments have cooperated in trying to understand the ARD problem, and the necessary work and associated costs for remediation and treatment. A March 1998 report concluded that the high density sludge lime process was the best way to treat the ARD at the former mine site.

In 2001, the Province provided indemnification for environmental liabilities to the successor companies of the mine operators in exchange for $30 million. Using this money, the government has taken on the task of remediation at the mine site. The current estimated total cost for remediation and treatment is $75 million.

Source: Britannia Mine Remediation Project, WLAP
http://wlapwww.gov.bc.ca/wy/p2/britannia/index.htm

Appendix D: Alberta's Oil and Gas Orphan Fund

The Orphan Fund

The Orphan Fund is part of a joint industry-government initiative that is funded by the oil and gas industry through an annual levy on suspended and inactive wells. The fund was originally created to pay for the clean-up of the liability associated with the downhole abandonment of orphan wells. In 1996, industry and government agreed to expand the scope of the Orphan Fund to include pipeline abandonment, facility decommissioning, decontamination and site reclamation. Implementation of this expanded scope is currently underway. The Alberta government supports the Orphan Fund through its regulatory agencies. They initiate the appropriate enforcement actions to ensure that responsible parties address their technical and financial obligations, and to minimize the creation of new orphans.

The Alberta Orphan Program

The Alberta Orphan Program directs the operations of clean-up activities on orphan wells and associated infrastructure and sites. The activities of the program are paid for out of the Orphan Fund, in accordance with an annual budget approved by the Fund Advisory Committee and its respective member organizations.

The Fund Advisory Committee

The Fund Advisory Committee is composed of representatives from the Alberta Energy and Utilities Board, Canadian Association of Petroleum Producers, Small Explorers and Producers Association of Canada, Alberta Environment, Alberta Department of Agriculture, Food and Rural Development and Alberta Department of Resource Development. In addition to directing the clean-up activities of the Alberta Orphan Program, the Fund Advisory Committee sets policy related to the administration and use of the fund.

Appendix D: Alberta's Oil and Gas Orphan Fund

Determining Orphans

A group of industry representatives from the Canadian Association of Petroleum Producers and the Small Explorers and Producers Association of Canada sit on a committee with the Energy and Utilities Board and Alberta Environment to review cases of potential orphans. This subcommittee of the Fund Advisory Committee is referred to as the Peer Review Group. The Peer Review Group meets monthly to review recommendations from the Energy and Utilities Board and Alberta Environment to deem wells, pipelines, facilities and well sites orphans. A high degree of diligence is required from the government agencies to show that every reasonable attempt has been made to recover money from responsible parties before cases are deemed as orphans. Once they are so deemed, authorization is given to the Alberta Orphan Program to make expenditures out of the fund to conduct the abandonment and reclamation activities.

Funding Sources

Revenue for the Orphan Fund comes from two main sources:

- an annual levy paid by industry based on the number of inactive wells each operator has on December 31 of the previous calendar year (this is the main revenue source for the Orphan Fund);
- and a first-time licensee fee, which is a one-time start-up fee, charged to all new licensees.

Source: Alberta Energy and Utilities Board, Canadian Association of Petroleum Producers, and the Small Explorers and Producers Association of Canada. 2002. Orphan Fund Annual Report

Appendix E: Office of the Auditor General: Risk Auditing Objectives and Methodology

The Office has four lines of business:

- Attesting to the reliability of government financial statements;
- Assessing the quality of government service plan and reports;
- Assessing the management of risk within government programs and services; and
- Providing strong support to the standing committees of the Legislative Assembly.

Each of these lines of business have certain objectives that are expected to be achieved, and each employs a particular methodology to reach those objectives. The following is a brief outline of the objectives and methodology applied by the Office for assessing the management of risk within government programs and services, that is, risk auditing.

Risk Auditing

What are Risk Audits?

Risk audits (also known as performance or value-for-money audits) examine whether money is being spent wisely by government—whether value is received for the money spent. Specifically, they look at the organizational and program elements of government performance, whether government is achieving something that needs doing at a reasonable cost, and consider whether government managers are:

- making the best use of public funds; and
- adequately accounting for the prudent and effective management of the resources entrusted to them.

The aim of these audits is to provide the Legislature with independent assessments about whether government programs are implemented and administered economically, efficiently and effectively, and whether Members of the Legislative Assembly and the public are being provided with fair, reliable accountability information with respect to organizational and program performance.

Appendix E: Office of the Auditor General: Risk Auditing Objectives and Methodology

In completing these audits, we collect and analyze information about how resources are managed; that is, how they are acquired and how they are used. We also assess whether legislators and the public have been given an adequate explanation of what has been accomplished with the resources provided to government managers.

Focus of Our Work

A risk audit has been described as:

> *...the independent, objective assessment of the fairness of management's representations on organizational and program performance, or the assessment of management performance, against criteria, reported to a governing body or others with similar responsibilities.*

This definition recognizes that there are two forms of reporting used in risk auditing. The first—referred to as attestation reporting—is the provision of audit opinions as to the fairness of management's publicly reported accountability information on matters of economy, efficiency and effectiveness. This approach has been used to a very limited degree in British Columbia because the organizations we audit do not yet provide comprehensive accountability reports on their organizational and program performance.

We believe that government reporting along with independent audit is the best way of meeting accountability responsibilities. Consequently, we have been encouraging the use of this model in the British Columbia public sector, and will apply it where comprehensive accountability information on performance is made available by management.

As the risk audits conducted in British Columbia use the second form of reporting—direct reporting—the description that follows explains that model.

Our "direct reporting" risk audits are not designed to question whether government policies are appropriate and effective (that is achieve their intended outcomes). Rather, as directed by the Auditor General Act, these audits assess whether the programs implemented to achieve government policies are being administered economically and efficiently. They also

evaluate whether Members of the Legislative Assembly and the public are being provided with appropriate accountability information about government programs.

When undertaking risk audits, we look for information about results to determine whether government organizations and programs actually provide value for money. If they do not, or if we are unable to assess results directly, we then examine management's processes to determine what problems exist or whether the processes are capable of ensuring that value is received for money spent.

Selecting Audits

All of government, including Crown corporations and other government organizations, are included in the universe we consider when selecting audits. We also may undertake reviews of provincial participation in organizations outside of government if they carry on significant government programs and receive substantial provincial funding.

When selecting the audit subjects we will examine, we base our decision on the significance and interest of an area or topic to our primary clients, the Members of the Legislative Assembly and the public. We consider both the significance and risk in our evaluation. We aim to provide fair, independent assessments of the quality of government administration and to identify opportunities to improve the performance of government. Therefore, we do not focus exclusively on areas of high risk or known problems.

We select for audit either programs or functions administered by a specific ministry or government organization, or cross-government programs or functions that apply to many government entities. A large number of such programs and functions exist throughout government. We examine the larger and more significant of these on a cyclical basis.

Our view is that, in the absence of comprehensive accountability information being made available by government, risk audits using the direct reporting approach should be undertaken on a five- to six- year cycle so that Members of the Legislative Assembly and the public receive assessments of all significant government operations over a reasonable time period. We strive to achieve this schedule, but it is affected by the availability of time and resources.

Appendix E: Office of the Auditor General: Risk Auditing Objectives and Methodology

Planning and Conducting Audits

A risk audit comprises four phases—preliminary study, planning, conducting and reporting. The core values of the Office—independence, due care and public trust—are inherent in all aspects of the audit work.

Preliminary Study

Before an audit starts, we undertake a preliminary study to identify issues and gather sufficient information to decide whether an audit is warranted.

At this time, we also determine the audit team. The audit team must be made up of individuals who have the knowledge and competence necessary to carry out the particular audit. In most cases, we use our own professionals, who have training and experience in a variety of fields. As well, we often supplement the knowledge and competence of our staff by engaging one or more consultants to be part of the audit team.

In examining a particular aspect of an organization to audit, auditors can look either at results, to assess whether value for money is actually achieved, or at management's processes, to determine whether those processes should ensure that value is received for money spent. Neither approach alone can answer all the questions of legislators and the public, particularly if problems are found during the audit. We therefore try to combine both approaches wherever we can. However, because acceptable results-oriented information and criteria are often not available, our risk audits frequently concentrate on management's processes for achieving value for money.

If a preliminary study does not lead to an audit, the results of the study may still be reported to the Legislature.

Planning

In the planning phase, the key tasks are to develop audit criteria—"standards of performance"—and an audit plan outlining how the audit team will obtain the information necessary to assess the organization's performance against the criteria. In establishing the criteria, we do not expect theoretical perfection from public sector managers; rather, we reflect what we believe to be the reasonable expectations of legislators and the public.

Appendix E: Office of the Auditor General: Risk Auditing Objectives and Methodology

Conducting

The conducting phase of the audit involves gathering, analysing and synthesizing information to assess the organization's performance against the audit criteria. We use a variety of techniques to obtain such information, including surveys, and questionnaires, interviews and document reviews.

Reporting Audits

We discuss the draft report with the organization's representatives and consider their comments before the report is formally issued to the Legislative Assembly. In writing the audit report, we ensure that recommendations are significant, practical and specific, but not so specific as to infringe on management's responsibility for managing. The final report is tabled in the Legislative Assembly and referred to the Public Accounts Committee, where it serves as a basis for the Committee's deliberations.

Reports on risk audits are published throughout the year as they are completed, and tabled in the Legislature at the earliest opportunity. We report our audit findings in two parts: an Auditor General's Comments section and a more detailed report. The overall conclusion constitutes the Auditor General's independent assessment of how well the organization has met performance expectations. The more detailed report provides background information and a description of what we found. When appropriate, we also make recommendations as to how the issues identified may be remedied.

It takes time to implement the recommendations that arise from risk audits. Consequently, when management first responds to an audit report, it is often only able to indicate its intention to resolve the matters raised, rather than to describe exactly what it plans to do.

Without further information, however, legislators and the public would not be aware of the nature, extent, and results of management's remedial actions. Therefore, we publish updates of management's responses to the risk audits. In addition, when it is useful to do so, we will conduct follow-up audits. The results of these are also reported to the Legislature.

Appendix F: Office of the Auditor General: 2002/03 Reports Issued to Date

Report 1

Building a Strong Work Environment in British Columbia's Public Service: A Key to Delivering Quality Service

Report 2

Follow-up of Performance Reports

Report 3

A Review of Financial Management Issues in the Office of the Police Complaint Commissioner

Report 4

Monitoring the Government's Finances

Report 5

Managing Contaminated Sites on Provincial Lands

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